FIG. 1

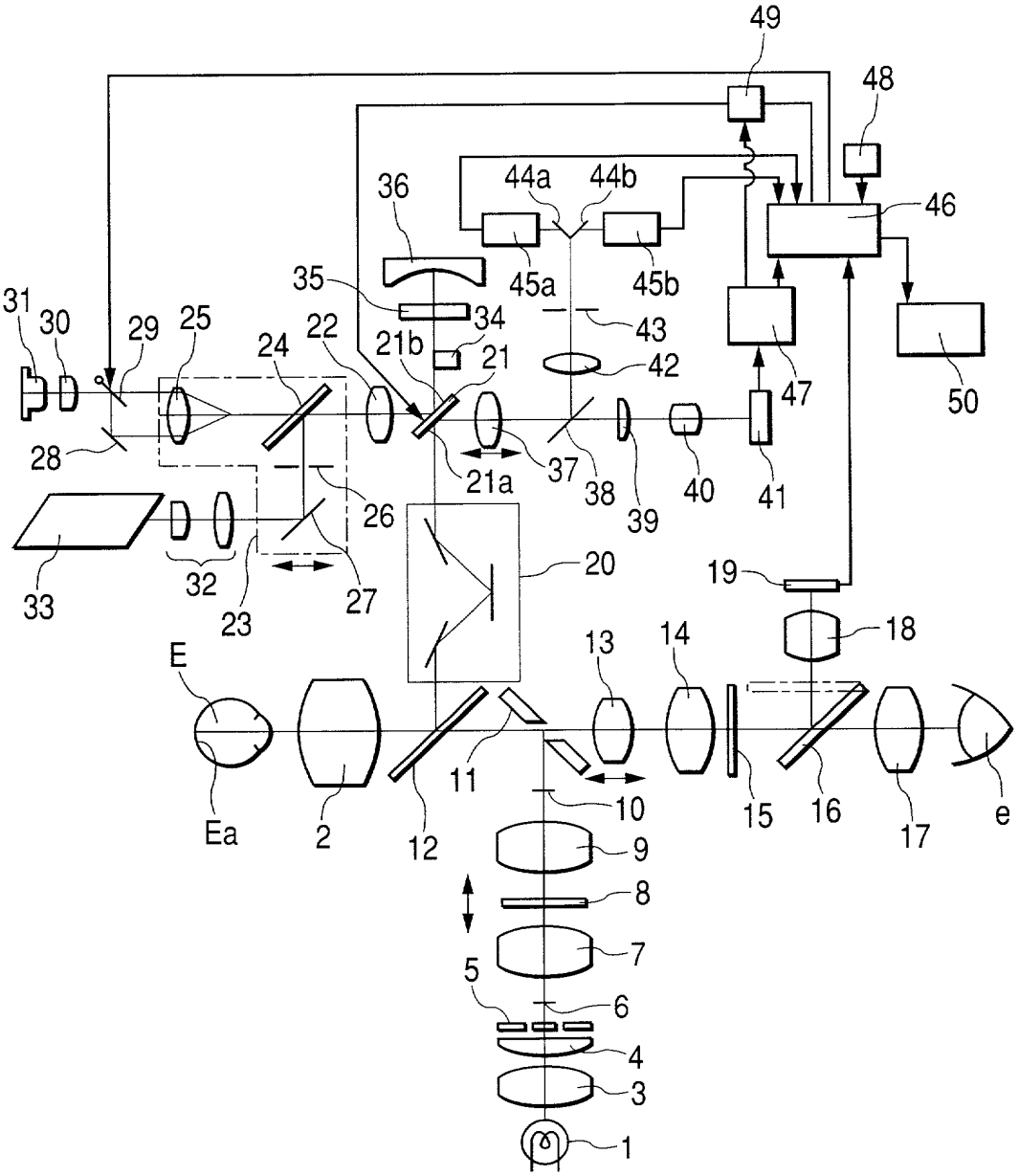

49
48
36
44a
44b
46
45a
45b
35
34
43
31
30
29
25
24
22
21b
21
42
47
50
28
21a
37
38
39
40
41
26
33
32
23
27
20
19
18
E
13
14
Ea
2
12
11
10
15
16
17
e
9
8
7
5
6
4
3
1

FIG. 2

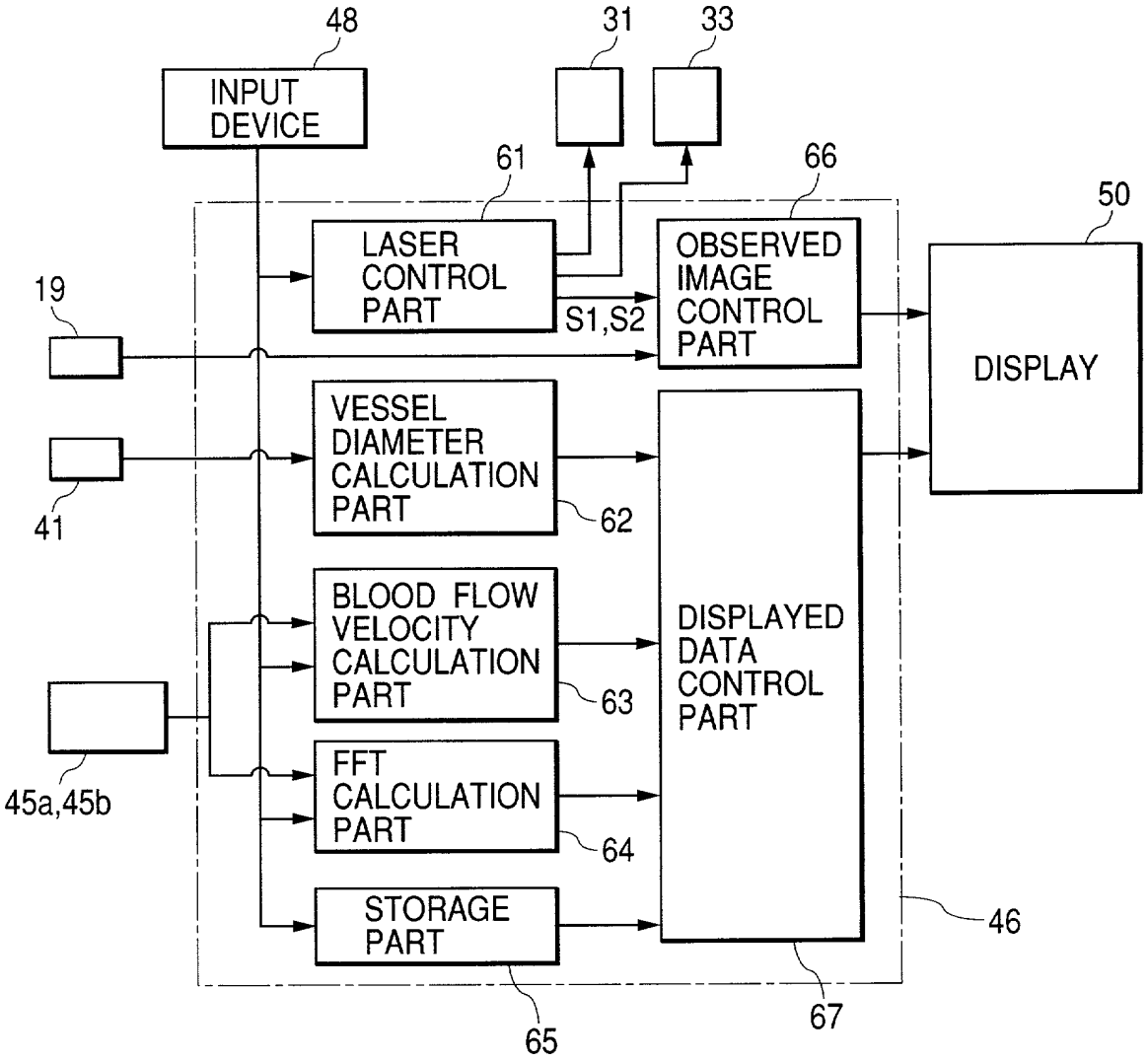

48
INPUT DEVICE
31
33
61
66
50
LASER CONTROL PART
S1,S2
OBSERVED IMAGE CONTROL PART
DISPLAY
19
41
VESSEL DIAMETER CALCULATION PART
62
BLOOD FLOW VELOCITY CALCULATION PART
63
DISPLAYED DATA CONTROL PART
45a,45b
FFT CALCULATION PART
64
STORAGE PART
46
65
67

FIG. 3

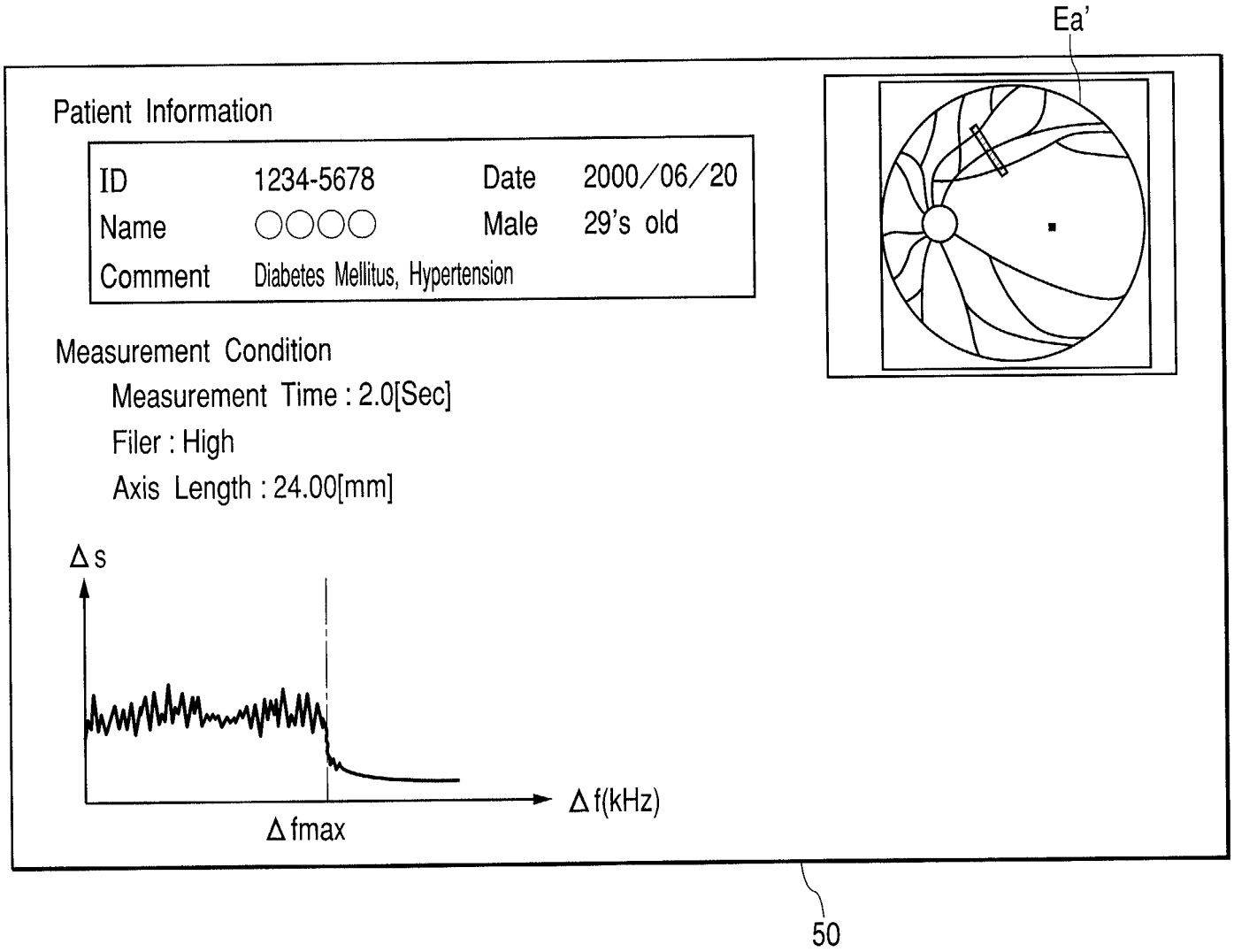

Ea'
Patient Information
ID 1234-5678 Date 2000/06/20
Name ○○○○ Male 29's old
Comment Diabetes Mellitus, Hypertension
Measurement Condition
Measurement Time : 2.0[Sec]
Filer : High
Axis Length : 24.00[mm]
Δs
Δf(kHz)
Δfmax
50

FIG. 4

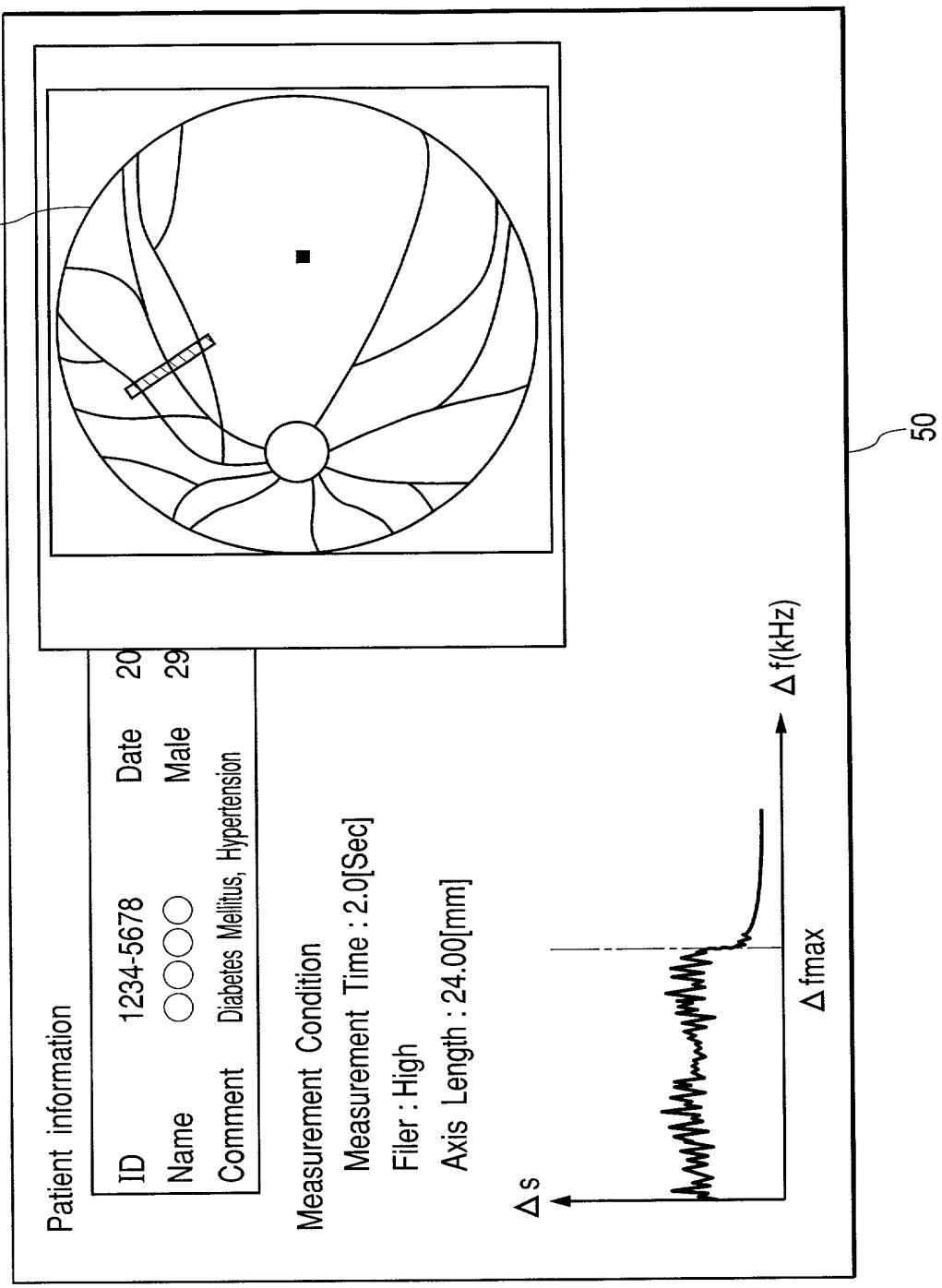

Ea'
Patient information
ID 1234-5678 Date 20
Name ○○○○ Male 29
Comment Diabetes Mellitus, Hypertension
Measurement Condition
Measurement Time : 2.0[Sec]
Filer : High
Axis Length : 24.00[mm]
Δ s
Δ f(kHz)
Δ fmax
50

FIG. 5

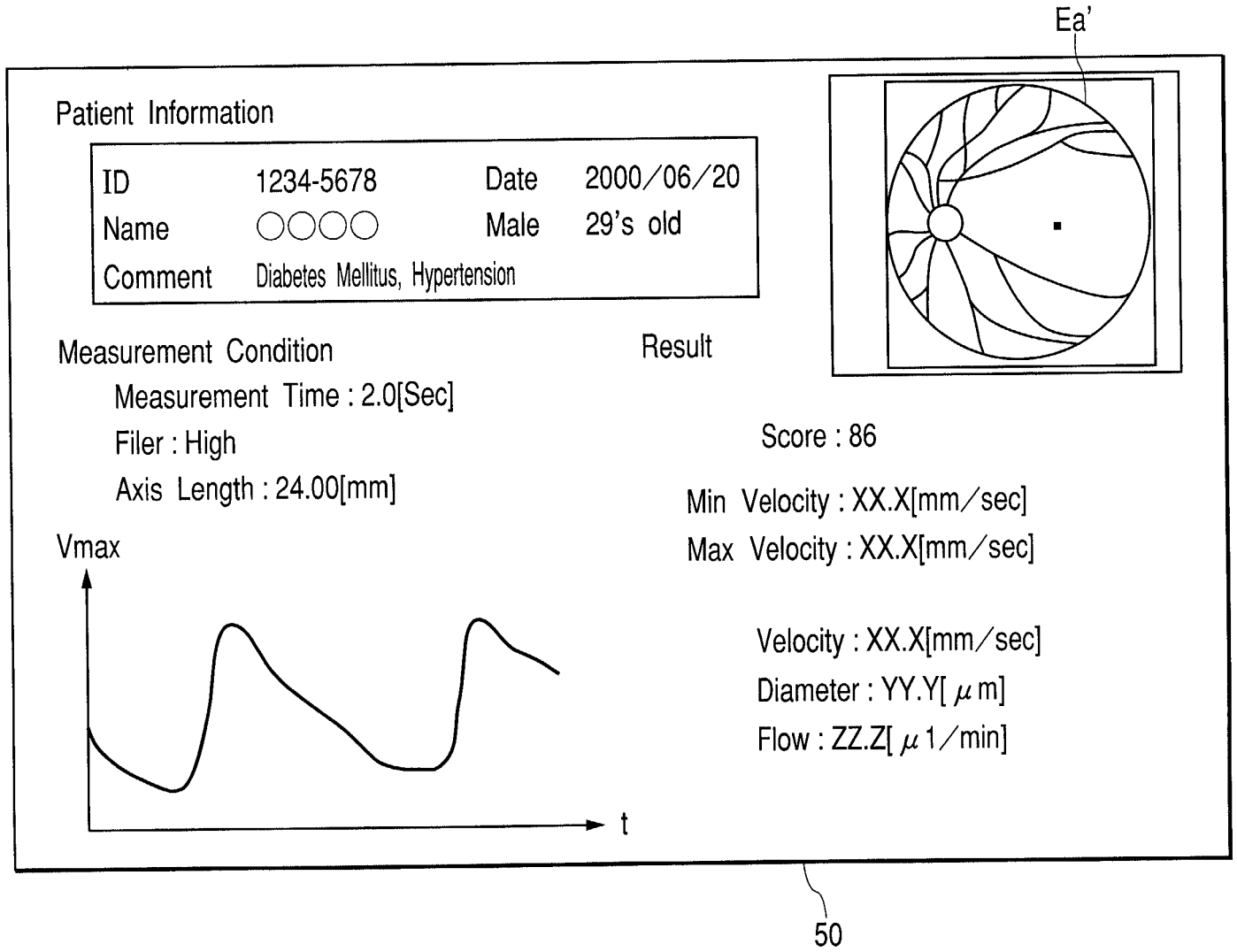

Ea'
Patient Information
ID 1234-5678 Date 2000/06/20
Name ○○○○ Male 29's old
Comment Diabetes Mellitus, Hypertension
Measurement Condition
Measurement Time : 2.0[Sec]
Filer : High
Axis Length : 24.00[mm]
Result
Score : 86
Min Velocity : XX.X[mm/sec]
Max Velocity : XX.X[mm/sec]
Vmax
t
Velocity : XX.X[mm/sec]
Diameter : YY.Y[μm]
Flow : ZZ.Z[μl/min]
50

FIG. 6

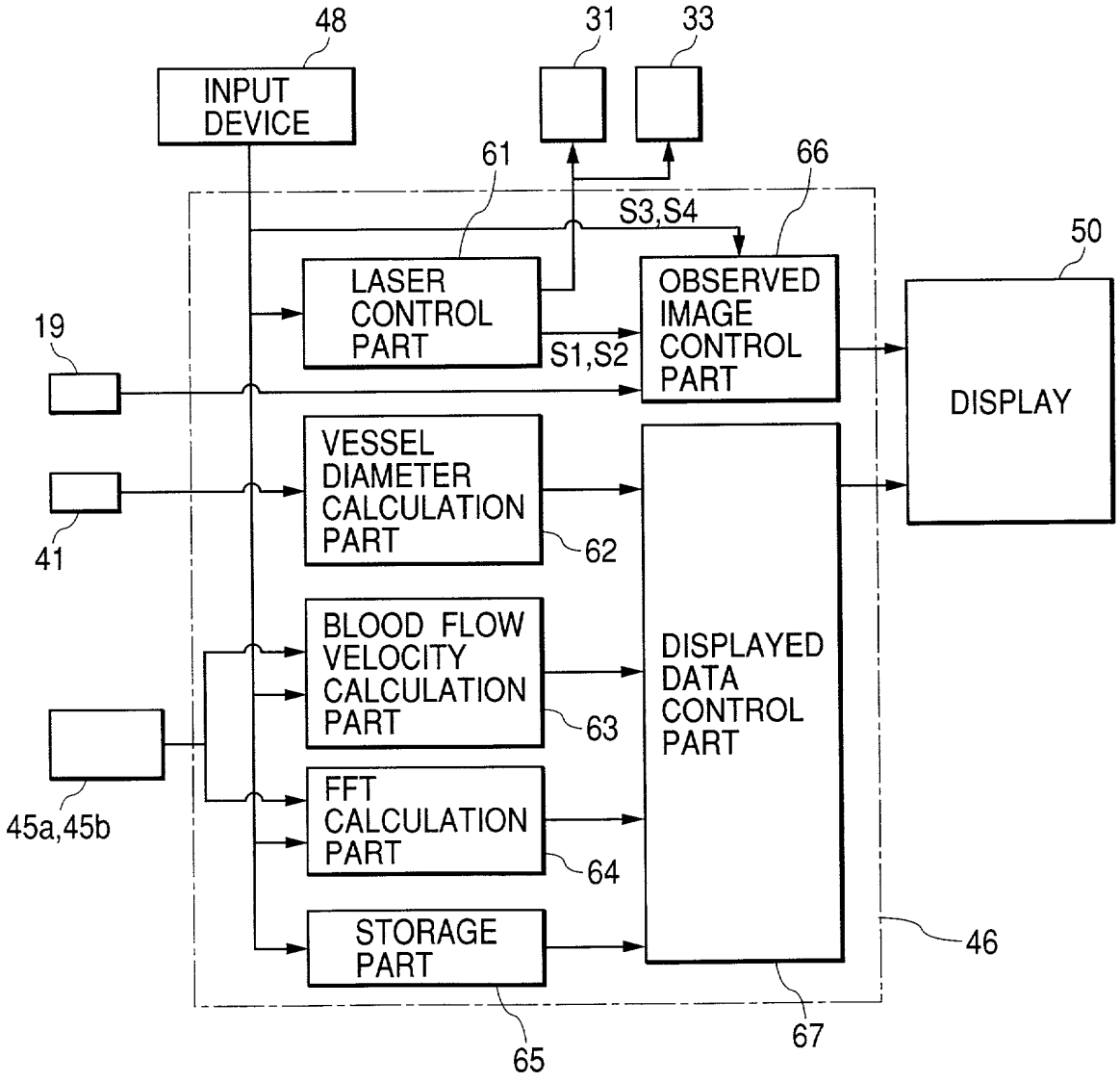

48
INPUT DEVICE
31
33
61
66
S3,S4
50
LASER CONTROL PART
S1,S2
OBSERVED IMAGE CONTROL PART
DISPLAY
19
41
VESSEL DIAMETER CALCULATION PART
62
BLOOD FLOW VELOCITY CALCULATION PART
63
DISPLAYED DATA CONTROL PART
45a,45b
FFT CALCULATION PART
64
STORAGE PART
46
65
67

FIG. 7

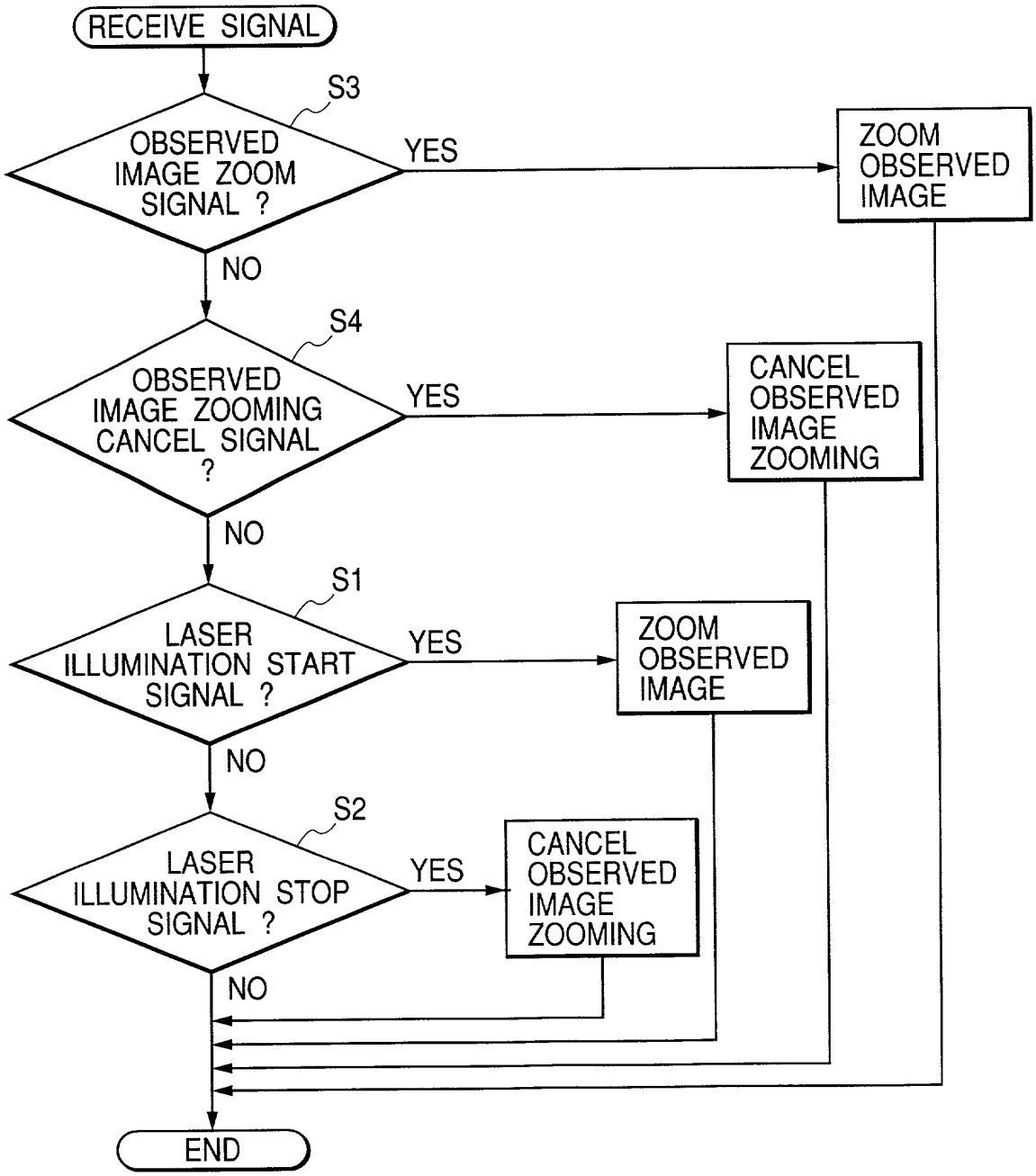

RECEIVE SIGNAL
S3
OBSERVED IMAGE ZOOM SIGNAL ?
YES
ZOOM OBSERVED IMAGE
NO
S4
OBSERVED IMAGE ZOOMING CANCEL SIGNAL ?
YES
CANCEL OBSERVED IMAGE ZOOMING
NO
S1
LASER ILLUMINATION START SIGNAL ?
YES
ZOOM OBSERVED IMAGE
NO
S2
LASER ILLUMINATION STOP SIGNAL ?
YES
CANCEL OBSERVED IMAGE ZOOMING
NO
END

FIG. 8

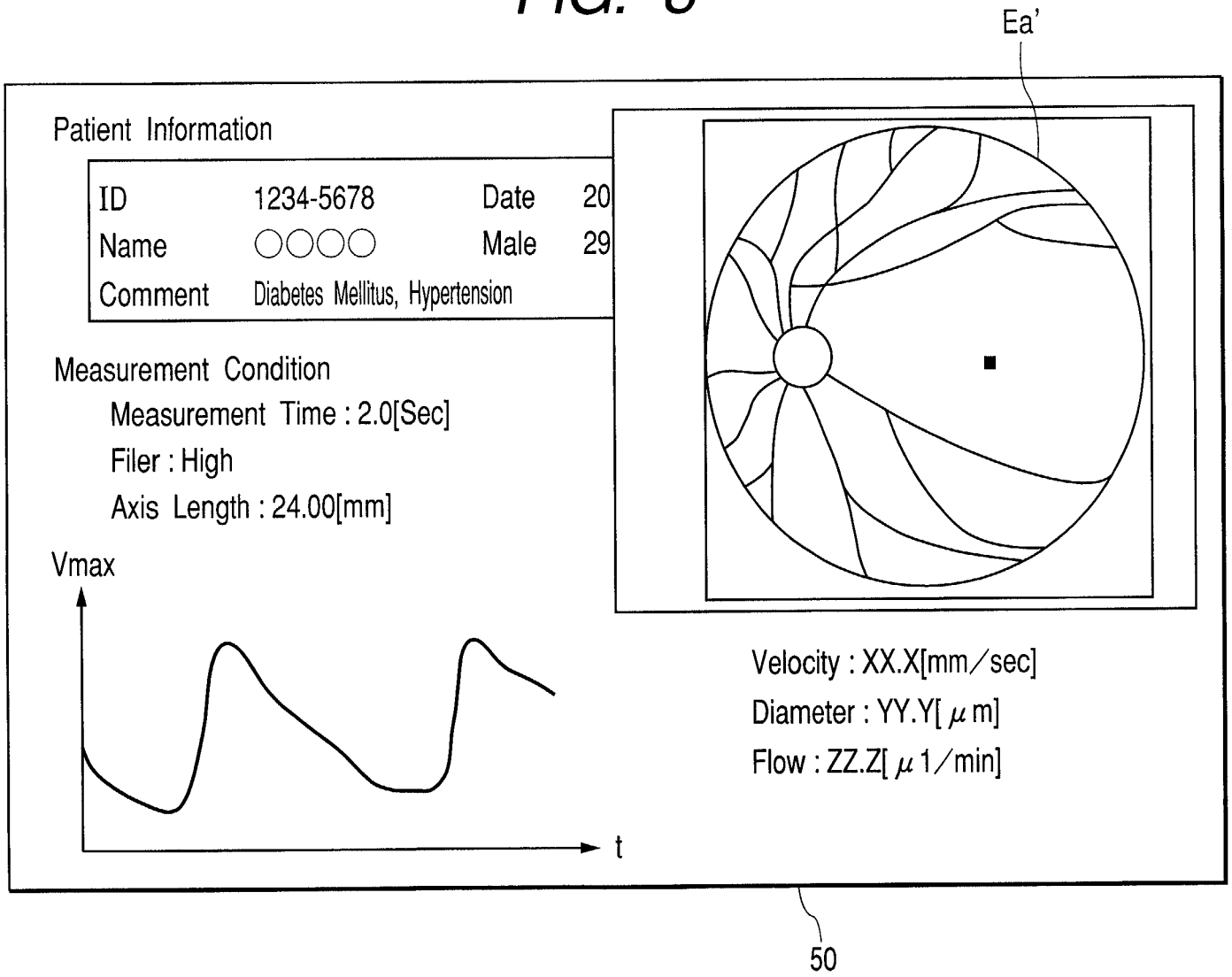

Ea'
Patient Information
ID 1234-5678 Date 20
Name ○○○○ Male 29
Comment Diabetes Mellitus, Hypertension
Measurement Condition
Measurement Time : 2.0[Sec]
Filer : High
Axis Length : 24.00[mm]
Vmax
t
Velocity : XX.X[mm/sec]
Diameter : YY.Y[μm]
Flow : ZZ.Z[μl/min]
50

FIG. 9

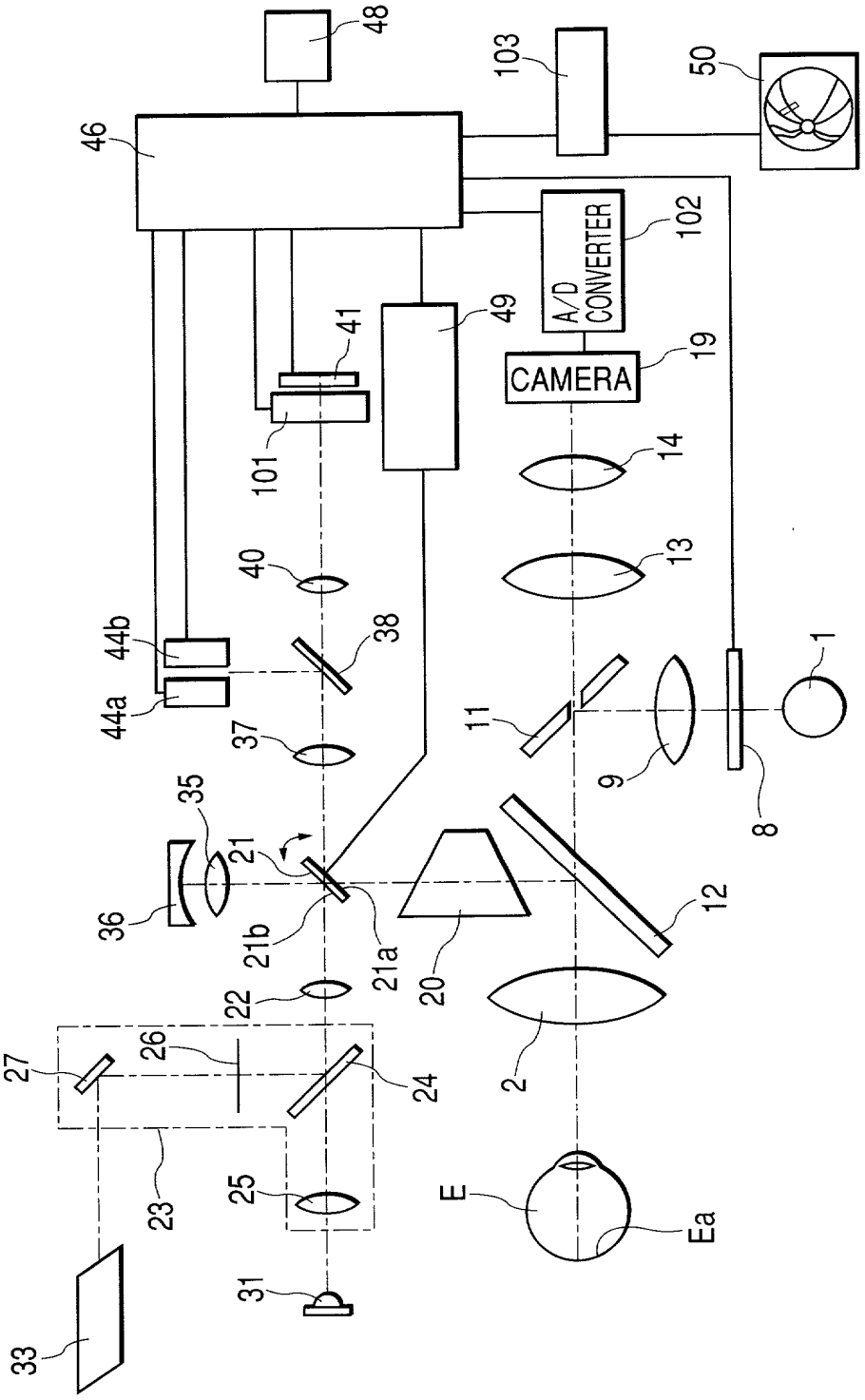

48
103
50
46
A/D CONVERTER
102
49
41
CAMERA
19
101
14
40
13
38
44b
1
44a
37
11
9
35
8
21
36
21b
21a
20
12
22
2
27
26
24
23
25
E
Ea
31
33

FIG. 10

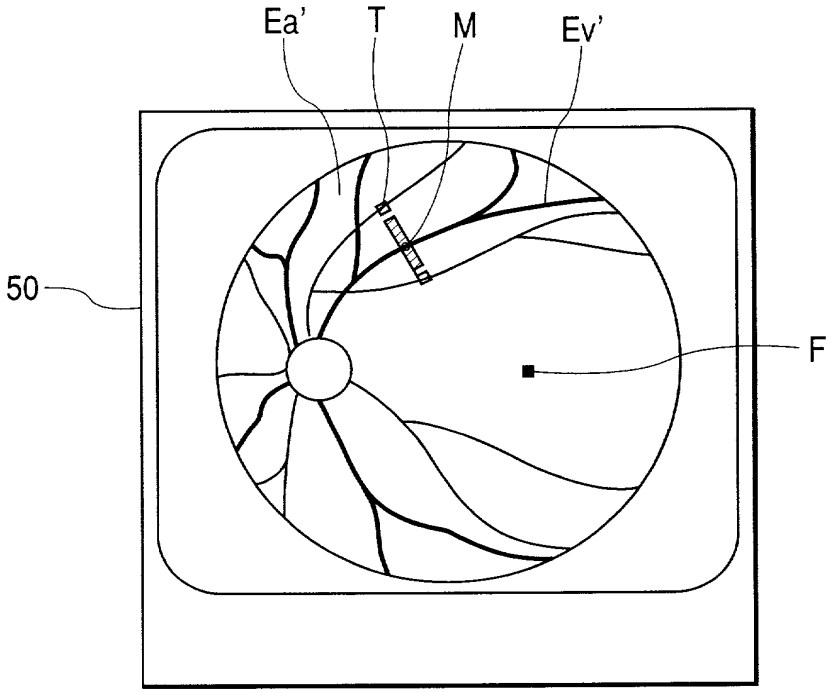


FIG. 11

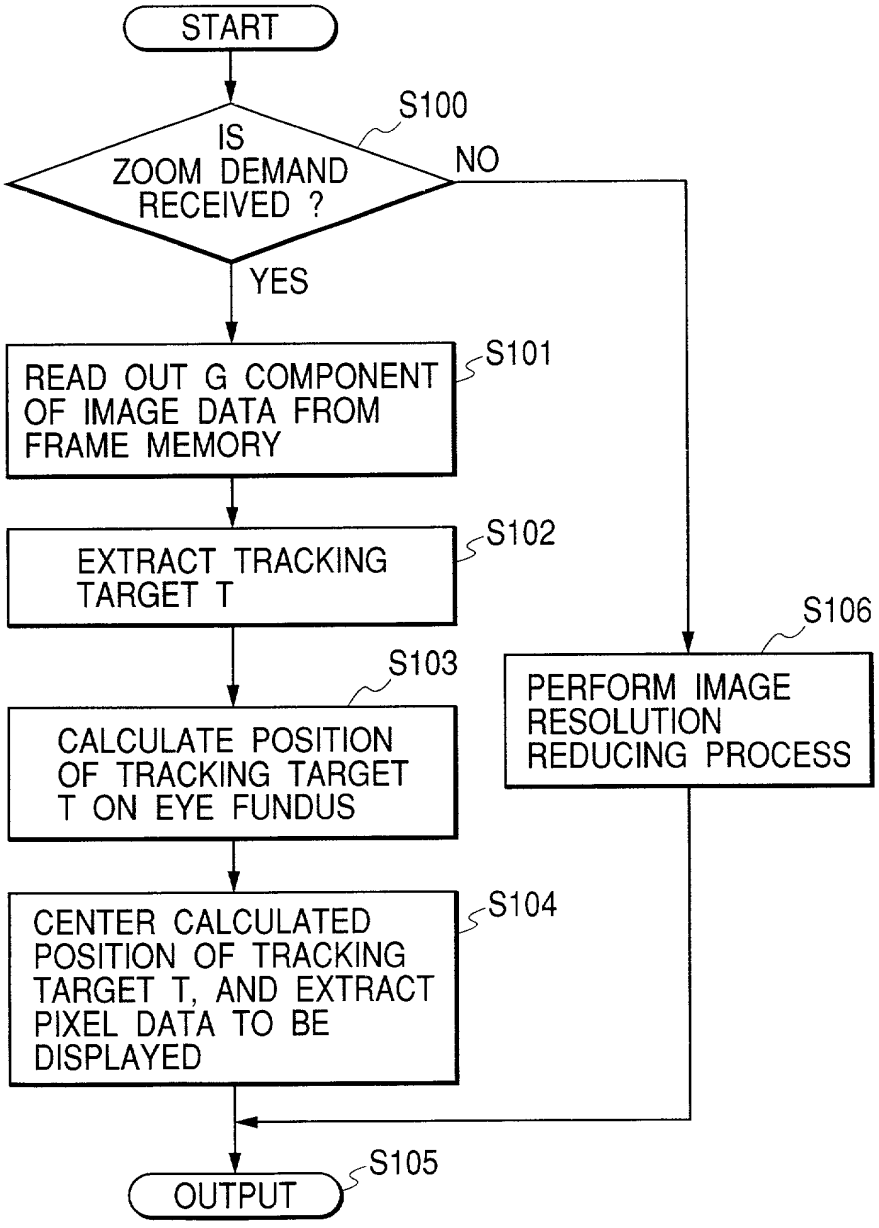

START
S100
IS ZOOM DEMAND RECEIVED ?
NO
YES
READ OUT G COMPONENT OF IMAGE DATA FROM FRAME MEMORY
S101
EXTRACT TRACKING TARGET T
S102
CALCULATE POSITION OF TRACKING TARGET T ON EYE FUNDUS
S103
CENTER CALCULATED POSITION OF TRACKING TARGET T, AND EXTRACT PIXEL DATA TO BE DISPLAYED
S104
PERFORM IMAGE RESOLUTION REDUCING PROCESS
S106
OUTPUT
S105

FIG. 12

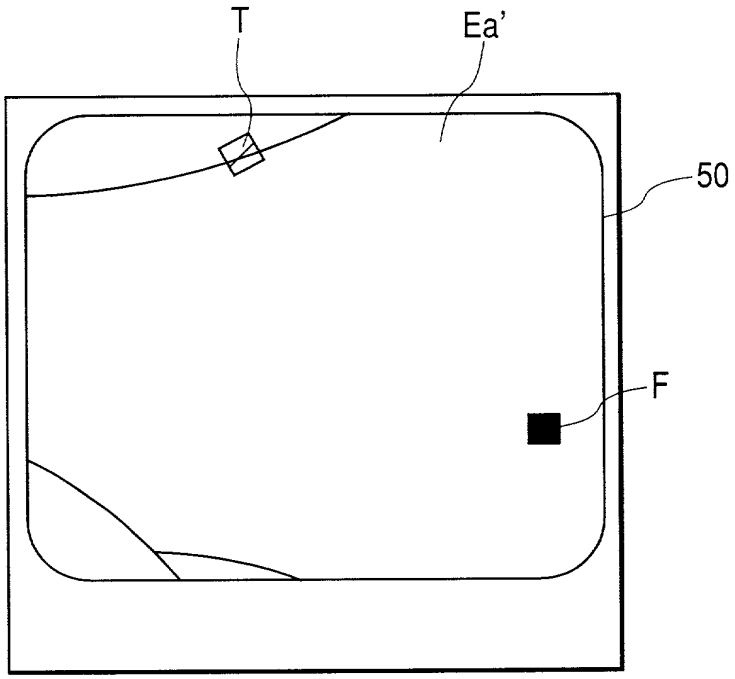


FIG. 13

	x[n]	x[n+1]	x[n+2]	x[n+3]	x[n+4]	x[n+5]	x[n+6]	x[n+7]	x[n+8]	x[n+9]	x[n+10]	x[n+11]	x[n+12]	x[n+13]	x[n+14]	x[n+15]
y[n]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
y[n+1]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
y[n+2]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
y[n+3]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
y[n+4]	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0
y[n+5]	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
y[n+6]	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0
y[n+7]	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
y[n+8]	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0
y[n+9]	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
y[n+10]	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0
y[n+11]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
y[n+12]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
y[n+13]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
y[n+14]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
y[n+15]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

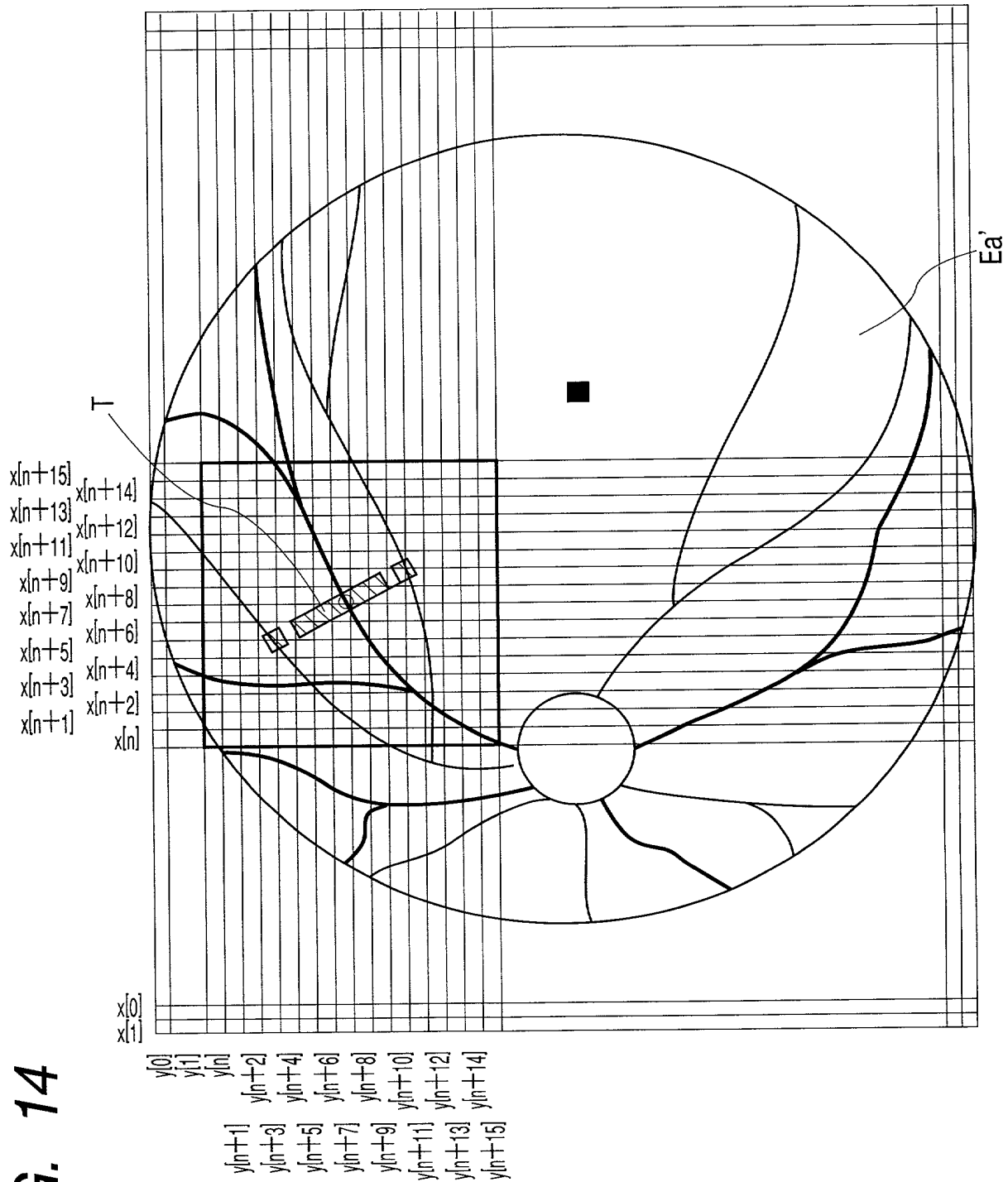

T
Ea'
x[n+15]
x[n+13]
x[n+11]
x[n+9]
x[n+7]
x[n+5]
x[n+3]
x[n+1]
x[n+14]
x[n+12]
x[n+10]
x[n+8]
x[n+6]
x[n+4]
x[n+2]
x[n]
x[0]
x[1]
y[0]
y[1]
y[n]
y[n+2]
y[n+4]
y[n+6]
y[n+8]
y[n+10]
y[n+12]
y[n+14]
y[n+1]
y[n+3]
y[n+5]
y[n+7]
y[n+9]
y[n+11]
y[n+13]
y[n+15]

FIG. 14

FIG. 15

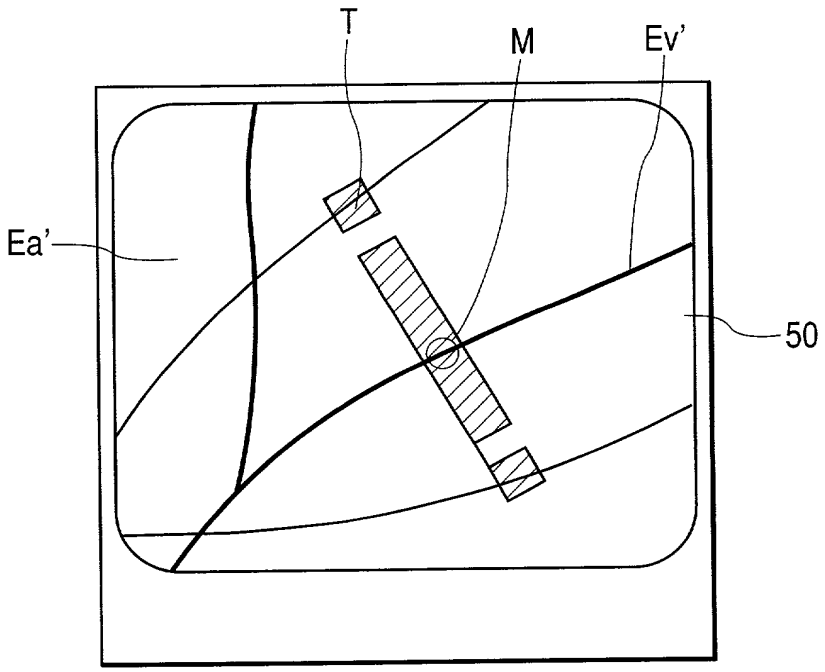


FIG. 16

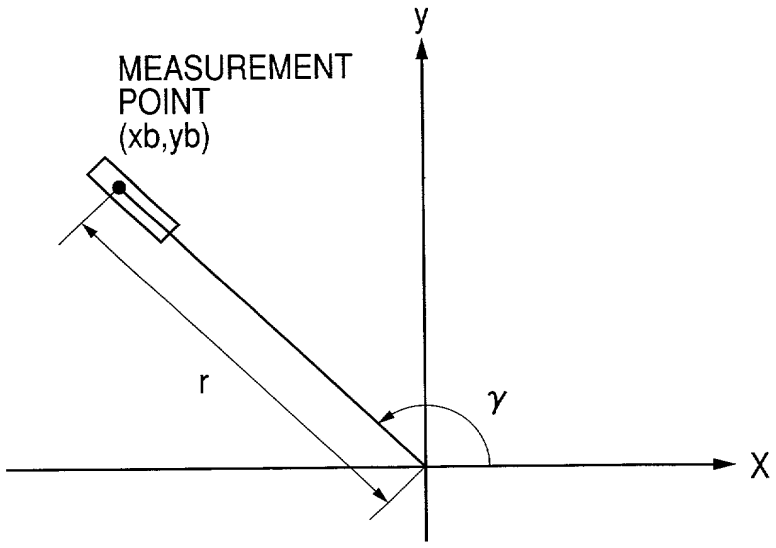
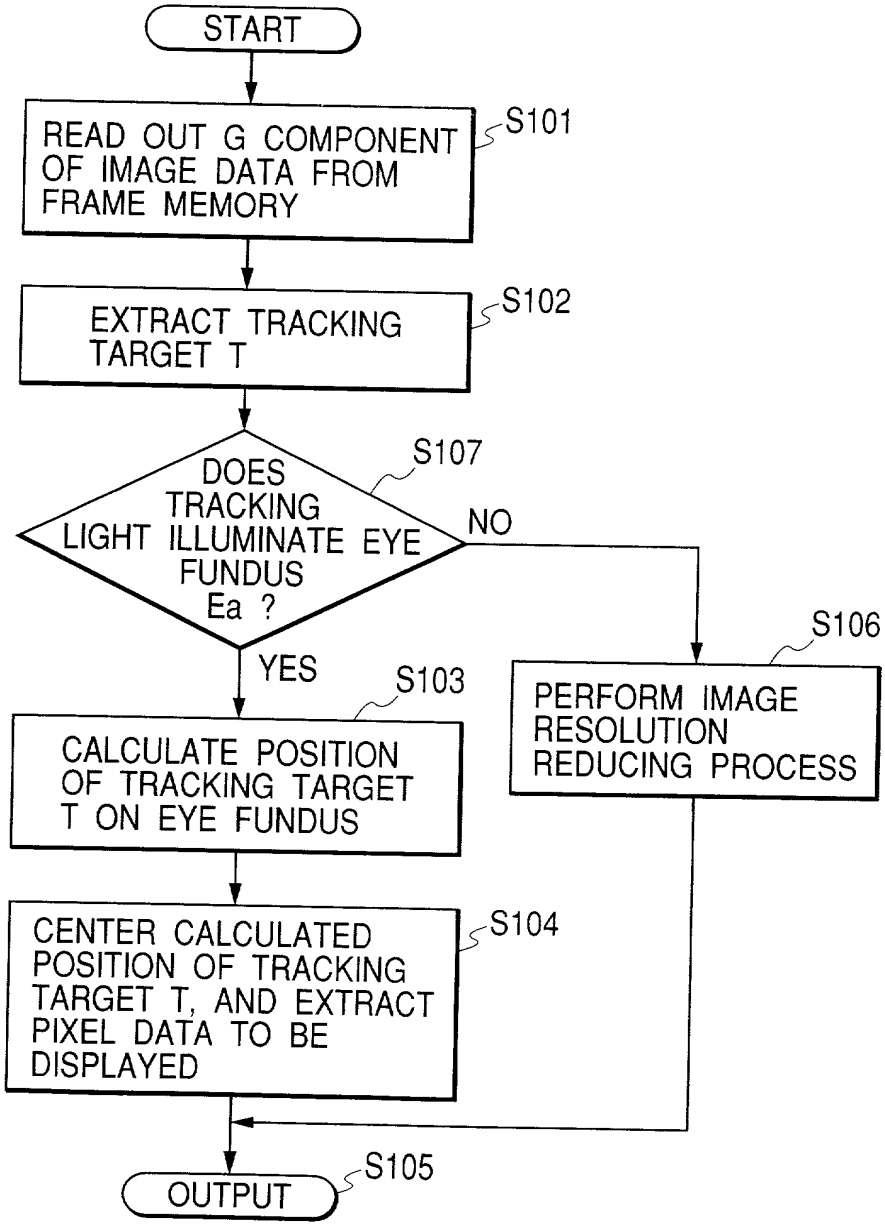


FIG. 17


START
READ OUT G COMPONENT OF IMAGE DATA FROM FRAME MEMORY
S101
EXTRACT TRACKING TARGET T
S102
DOES TRACKING LIGHT ILLUMINATE EYE FUNDUS Ea ?
S107
NO
YES
S103
CALCULATE POSITION OF TRACKING TARGET T ON EYE FUNDUS
S106
PERFORM IMAGE RESOLUTION REDUCING PROCESS
CENTER CALCULATED POSITION OF TRACKING TARGET T, AND EXTRACT PIXEL DATA TO BE DISPLAYED
S104
OUTPUT
S105